

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHRISTOPHE DELAVEAUD
and BERNARD JECKO

Appeal No. 2001-1536
Application 08/428,256¹

ON BRIEF

Before HAIRSTON, BARRETT, and GROSS, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 2-10. Claim 1 has been canceled.

We affirm-in-part.

¹ Application for patent filed May 2, 1995, entitled "Monopole Wire-Plate Antenna."

BACKGROUND

The invention relates to an antenna as may be understood from claim 10, the sole independent claim, reproduced below.²

10. A monopole wire-plate antenna having a working frequency, and comprising a ground plane, a first radiating element in the form of a capacity top adapted to be directly connected to a generator or to a receiver via a feed wire, and a second radiating element in the form of a plurality of conductor wires connecting the capacity top to the ground plane characterized by the fact that the antenna comprises a plurality of at least one of said radiating elements, wherein, the antenna having a working wavelength λ , the dimensions of the capacity top are roughly $\lambda/8$ by $\lambda/8$ that is sufficiently small relative to said wavelength, whereby the antenna operates by monopolar radiation at the working frequency.

The examiner relies on the following references:

Reggia	3,852,760	December 3, 1974
Goubau	3,967,276	June 29, 1976
Shibano et al. (Shibano)	4,123,758	October 31, 1978
Parham	4,896,162	January 23, 1990

² There appears to be an indefiniteness problem with claims 10 and 2. Claim 10 recites "a first radiating element ... and a second radiating element in the form of a plurality of conductor wires ... characterized by the fact that the antenna comprises a plurality of at least one of said radiating elements." We interpret this to mean "a plurality of first radiating elements" or "a plurality of second radiating elements" or "a plurality of first and second radiating elements." However, since the "second radiating element" already comprises a "plurality of conductor wires," it is not clear whether a plurality of second radiating elements in claim 10 is trying to claim a plurality of a plurality. It is not clear whether "radiating wires" in claim 2 is meant to refer to the "conductor wires" in claim 10; if so, the claim is indefinite because claim 10 already claims a plurality of conductor wires and claim 2 recites a plurality of a plurality which is a plurality. If "radiating wires" refers to a new element, it is not clear what element is meant. We leave it to appellants and the examiner to clarify these claims.

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Nishikawa et al. (Nishikawa) 5,146,232 September 8, 1992

Claims 2, 3, and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishikawa or Reggia.

Claims 2-4 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Goubau.

Claims 4-7 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishikawa or Reggia or Goubau, each in view of Shibano.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishikawa or Reggia or Goubau, each in view of Parham.

We refer to the final rejection (Paper No. 22) (pages referred to as "FR__") and the examiner's answer (Paper No. 28) (pages referred to as "EA__") for a statement of the examiner's rejection, and to the brief (Paper No. 26) (pages referred to as "Br__") for a statement of appellants' arguments thereagainst.

OPINION

Nishikawa

The examiner reads claim 10 on Figs. 1-4 of Nishikawa (FR2). Nishikawa discloses that the vertical feeding plate 26 in Fig. 1 is an improvement to a feed line which connects at only one point in Fig. 15 (col. 2, lines 7-59). Nishikawa has a plurality of conducting wires 30. The difference between Nishikawa and the subject matter of claim 10 is that Nishikawa discloses that the

dimensions of the rectangular parallel plate (table) are $L_1=0.21\lambda_0$ and $L_2=0.18\lambda_0$ (col. 9, line 26), whereas claim 10 recites that "the dimensions of the capacity top are roughly $\lambda/8$ by $\lambda/8$," i.e., 0.13λ by 0.13λ . The examiner states that the specific size of the plate is "an obvious design choice dependent upon feeder impedance, impedance matching, radiation pattern desired, etc." (FR2) and concludes that selection of "such a top hat dimension is well within the ordinary level of skill of those employed in the antenna art" (FR2).

Initially, we note that appellant does not contest the examiner's conclusion that selecting the size of the capacitor top would have been within the level of skill of one of ordinary skill in the art and, so, has not shown error. In addition, it is noted that the recitation that the dimensions are "roughly" $\lambda/8$ by $\lambda/8$ allows a lot of leeway which would encompass or be made obvious by the disclosed size of 0.21λ by 0.18λ .

Appellant argues (Br4):

[T]here are several important features of the presently claimed monopole wire-plate antenna which would not be suggested to one of ordinary skill in the art by the disclosure found in Nishikawa. For example, both dimensions "L1" and "L2" of the top plate of the antenna disclosed by Nishikawa are important to the operation of the antenna. In addition, currents flow within the top plate of the Nishikawa antenna. In contrast, in the presently claimed invention it is the surface of the plate which is important for enhanced performance, not dimensions L1 and L2. Moreover, no current flows through the plate in the present invention. In Appellant's invention the current flows through the ground and the feed wires which are coupled. In fact, it is the

current within the aforesaid wires, a current which, as noted above, is missing in Nishikawa, which generates the monopolar radiation in the presently claimed antenna.

The examiner responds that these arguments do not demonstrate that appellants' structure operates in a different way than Nishikawa and, in any case, are not directed to the claimed invention (EA4-5). We agree. The arguments fail to point out what language in claim 10 is not shown by Nishikawa and, thus, do not point out error in the rejection.

Appellant argues (Br4-5):

Still further, the height "H" of the device disclosed in Nishikawa is approximately $\lambda_0/9$, whereas in the antenna in the present invention, the height is about $\lambda/20$. Furthermore, in contrast to the disclosure of Nishikawa, the antenna of the present invention does not utilize a vertical plate such as that disclosed by the reference to extend the feed wire for adapting the antenna. Additionally, the radius of the ground wires of the antenna in the instant case is significantly smaller than that of the wires used in the Nishikawa device, whereas the diameter of the ground wire is of the same magnitude as the width "L1" of the top. As none of these distinctions are suggested by the disclosure of the Nishikawa reference, the claims to the present invention are not obvious thereover.

The examiner responds that the height, the connection of the feed wire to the capacity top, and the diameter of the conductor wires are not claimed and, thus, do not distinguish the subject matter of claim 10 over Nishikawa (EA5-6). We agree with the examiner. The height of the capacitor top above the ground plane is not claimed. Claim 10 recites a "capacity top adapted to be directly connected to a generator or to a receiver via a feed

wire" which does not preclude the use of the vertical feeding plate 26 in Nishikawa to connect (adapt) the plate 28 to the feed line 24a which is then connected to a generator. In any case, Nishikawa discloses that the vertical feeding plate 26 in Fig. 1 is an improvement to a feed line which connects at only one point in Fig. 15 (col. 2, lines 7-59), so Nishikawa teaches one skilled in the antenna art that a single feed line can be used. The diameter of the wires is not claimed.

We conclude that the examiner has established a prima facie case of obviousness which has not been shown to be in error by appellants. The rejection of claims 10, 2, and 3 over Nishikawa is sustained.

Reggia

The examiner finds that the antenna in Fig. 3 of Reggia "is clearly electrically the same as that claimed" (FR3) and, therefore, must produce a monopole radiation pattern (FR3). The examiner notes that the reference to omnidirectional radiation (col. 1, line 20) and vertical polarization (col. 2, lines 63-65) also indicates monopole radiation (FR3).

Appellants argue that the examiner errs because element 84 in Fig. 3 represents a capacitor, not a ground plane; element 92 represents a pin structure connecting the two capacitor plates, not a feed wire; and "Appellants' invention includes a feed wire

which passes through the ground plane (not a capacitor) and electrically connects to the capacitor top in a direct manner (Br7). It is further argued that there is nothing to suggest that Reggia's radiation is monopole (Br7).

The examiner responds that the bottom plate 84 is a ground plate and feed pin 92 is a feed wire which passes through the ground plate (EA9-10). "Therefore, the conductive elements in Reggia are functionally and electrically equivalent to appellant's disclosed antenna, particularly the antenna claimed." (EA10.) The examiner presents extensive discussion about "dipolar" and "monopole" (EA6-10) and finds that Reggia discloses a monopole antenna because "it produces an omnidirectional radiation pattern and radiates vertical polarization" (EA10).

We agree with the examiner that bottom plate 84 could be termed a ground plate, although the plates 82 and 84 are described as capacitor plates (col. 4, line 18) and the top plate 82 is described as being only slightly smaller than the bottom plate (col. 2, lines 11-17, in connection with plates 12 and 14 in Fig. 1). We also agree with the examiner that the pin 92 can be considered a feed wire and that the claim language, "a capacity top adapted to be directly connected to a generator or to a receiver via a feed wire," does not distinguish over the arrangement of the feed pin 92 connecting to the top plate 82 via the capacitor 90.

The determinative issue appears to be whether Reggia operates as a monopole antenna. We have considered the extensive conflicting arguments of appellants and the examiner, but it is hard to say who is right based only on arguments. However, if the examiner is correct that Reggia is electrically the same as the disclosed invention, then we think that there is at least a prima facie case that Reggia operates the same as the claimed invention. If the examiner is wrong on this point, then a factual basis for the examiner's finding is in error and the rejection must be reversed. Upon review, we find that Reggia is not electrically the same as the disclosed invention.

In the disclosed invention, the feed wire passes through the ground plate to the capacitor top without being electrically connected to the ground plate. This arrangement where a voltage is applied between the capacitor top (or a conductor attached to the capacitor top) and the ground plane is known to produce a monopole antenna, as described in Goubau. However, in Reggia, the input is connected to the plate 84 and the pin 92, as evidenced by Fig. 2 where the coil 64 is electrically connected between the plates 52 and 54 (col. 3, lines 42-45). The parallel spaced conductor posts in Fig. 3 take the place of a coil when a minimum of inductance is required (col. 4, lines 2-10). Thus, in Reggia, the current does not flow first to the capacitor top and then return to ground through posts 86; instead, the input is

applied to the posts 86 (the inductor) and the capacitor 90 in parallel. This is a different electrical configuration than the disclosed antenna and, therefore, we cannot infer that Reggia operates in the same way. While it is still possible that Reggia operates as a monopole antenna, we only find that there is not enough factual evidence to make this finding. Therefore, the rejection of claims 10, 2, and 3 over Reggia is reversed.

Goubau

Goubau discloses a monopole antenna. The examiner reads claim 10 on the antenna shown in Fig. 5 (see FR3). The examiner concludes that it would have been obvious "to employ the size of top hat claimed as desired in order to provide a specific pattern and system impedance" (FR3).

Appellants argue five distinctions over Goubau (Br10-11).

The examiner responds that the only modification necessary to Goubau is the size of the capacitor plates, the selection of which the examiner finds to be within the level of ordinary skill in the art (EA11). The examiner generally finds the arguments unsupported by claim language.

We agree with the examiner that appellant has not shown error in the rejection over Goubau. In particular, appellants have not shown that the limitations of claim 10 (as opposed to the disclosure) distinguish over the structure in Goubau.

First, it is argued that the lower end of the feeding poles 20 should be grounded and the excitation site moved from the bottom end of the poles 20 to the top of one of the poles 20 on the first capacitive plane, and the series inductances must be short circuited to produce the present invention (Br9; Br10).

Claim 10 recites "a capacity top adapted to be directly connected to a generator or to a receiver via a feed wire," but does not recite how the capacity top is "adapted" to be connected. The claim does not recite that a coax feed probe is connected to the capacity top. The conductors 20 in Goubau directly connect the capacitor plates to the input terminal (i.e., the generator) and no modifications are necessary to meet the limitation of "a first radiating element in the form of a capacity top adapted to be directly connected to a generator or to a receiver via a feed wire." Appellants have not said what language in claim 10 requires the short circuiting of the series inductances and so has not shown error in the rejection.

Second, it is argued that the first LC circuit is a series LC circuit which is grounded at one end and excited at another end, whereas the presently claimed LC circuit is a parallel LC circuit grounded at both ends and excited at an intermediate point (the capacitor plate) (Br9; Br10).

The examiner responds that series and parallel LC circuits are not at issue because they are not positively claimed (EA11;

EA13). We agree. Appellants have not said what claim language they are relying on. Claim 10 only requires that the feed wire is connected to the capacity top, which is shown by conductor 20 attached to a plate 22, and that a plurality of conductor wires connect the capacity top to the ground plane, which is shown by conductors 18. The capacity top can be all the plates, since an integral plate is not claimed, or can be just the plate 22, since claim 10 does not describe how the conductor wires connect the capacity top to the ground plane.

Third, it is argued that Goubau does not disclose, teach, or suggest the dimensions for achieving the monopole radiation as claimed and the present invention has a radiation yield which depends on a horizontal (rather than vertical) extension of the capacitive plate which allows resonance (Br9; Br10-11).

Goubau is directed to monopole antennas. Again, appellants have not said what claim language distinguishes claim 10 from the structure in Goubau. It appears that appellants are relying on differences between the disclosed invention and Goubau.

Fourth, it is argued that contrary to the Goubau structure, the height of the top plate in the present invention has no effect on yield (Br11).

Again, appellants have not shown how the claim language structurally defines over Goubau or requires a top plate whose height has no effect on yield.

Fifth, it is argued that Goubau discloses two duplicated antennas and the series LC circuit of Goubau and the parallel LC circuit of the presently claimed invention have opposite impedance behavior as a function of frequency (Br11). It is argued that there is no disclosure or suggestion for achieving a monopole state by making the dimensions of the monopole top sufficiently small relative to a working wavelength of the antenna whereby the antenna operates by monopolar radiation at the working frequency (Br11).

Again, appellants have not shown how the claim language defines over Goubau. Claim 10 is very broad and monopolar radiation is the only operation recited. Goubau is a monopole antenna and it is not stated why Goubau would cease to function as a monopole antenna depending on the size of the capacity top.

For the reasons stated above, we conclude that appellants have failed to show error in the examiner's conclusion of obviousness. The rejection of claims 10 and 2-4 over Goubau is sustained.

Nishikawa or Reggia or Goubau in view of Shibano

The examiner finds that Figs. 8(a)-(d) of Shibano teaches the use of plural capacity plates stacked above the other (FR4). The examiner finds (FR4): "Note in Fig. 8(d) that the feed cable 26, which passes through the ground plane 22, has a feed wire

23(2) and an outer ground conductor that connects the ground plane 22 to the capacity top between the ground plane and the capacity top that is connected to the feed wire, as recited in Claim 5." The examiner concludes that it would have been obvious to employ a plurality of stacked capacity plates in the primary references to provide additional frequencies of operation (FR4).

Appellants argue that none of the references teach stacking capacity plates in a monopole antenna (Br12) and that there is no suggestion to combine the teachings of Shibano with the other references (Br13). Appellants argue the purpose of plural capacity plates and respective feeds in the present invention is to provide additional resonant frequencies operable in a wide frequency band, which Shibano's multi-stage disc antenna provides radiation of non-directional electric waves of a plurality of frequencies simultaneously or selectively (Br12).

Shibano discloses a disc antenna which consists of a conductor disc and a conductor ground plate placed in parallel to each other and which radiates non-directional electric waves from the space between them (col. 1, lines 6-10). A signal source is connected between the conductor disc at a circumferential point while a suitable point on the conductor disc which is different from the feeding point is grounded by means of a grounding plate (col. 3, lines 40-50). Shibano achieves impedance matching by

suitably selecting the width of the inner conductor and the height from the conductor ground plane (col. 4, lines 36-40).

It does not appear that Shibano is a monopole antenna, as claimed, because it produces a standing electric field distribution around the conductor disc (col. 3, lines 46-47) which provides radiation directivity, rather than having the plurality of conductor wires connecting the capacitor top to the ground plane produce the electric field. Because Shibano seems to be a different kind of antenna, we do not find any motivation to combine the antenna structure of Shibano with the other references even though the stacked discs in Fig. 8(d) look similar to appellants' Fig. 2a and even though the examiner is correct that Fig. 8(d) broadly shows connection of a coaxial probe to the top capacitor plate and the outer conductor to the ground plane and even though claims 4-7 do not recite that the capacitor tops are stacked. Accordingly, the rejection of claims 4-7 and 9 over Nishikawa or Reggia or Goubau, each in view of Shibano, is reversed. It is noted that the previous rejection of claim 4 over Goubau alone is maintained because claim 4 does not distinguish over the multiple top arrangement of Goubau and because the rejection of claim 4 over Goubau alone has not been argued.

Nishikawa or Reggia or Goubau in view of Parham

The examiner cites Parham as evidence of the level of ordinary skill in the art (FR4). In particular, the examiner states that "Parham . . . shows between Figures 4 and 6 the obviousness of changing design from circular to rectangular capacitive plates 51,53,55, and connecting a radiating wire near the short side of the rectangle thereof" (FR4). The examiner concludes that it would have been obvious to employ the configuration of claim 8 "for the purpose of changing mounting geometry and capacitance of the antenna" (FR5).

Appellants argue that Parham does not teach or suggest preparing rectangular capacitive plates in a monopole antenna and teaches away from preparing a rectangular capacity top (Br14).

Initially, we note that Nishikawa teaches a rectangular parallel plate (table) with dimensions $L_1=0.21\lambda_0$ and $L_2=0.18\lambda_0$ (col. 9, line 26), where the wire conductors 30 are connected to the short L_2 side of the rectangle. Therefore, Parham is not required to meet the limitations of claim 8. The rejection of claim 8 is sustained over Nishikawa alone.

Parham does not cure the deficiency of Reggia apparently not being a monopole antenna as recited in claim 10. Accordingly, the rejection of claim 8 over Reggia and Parham is reversed.

As to the rejection of Goubau in view of Parham, while Parham shows that the annular capacitive plates 51, 53, 55 in Fig. 4 can be implemented as rectangular capacitive plates in

Fig. 6, we are not persuaded that Parham suggests such a modification of shape in a monopole antenna as shown in Goubau. However, even if it did, we find no suggestion that the radiating wire should be attached to the short side of the rectangle. Therefore, the rejection of claim 8 over Goubau and Parham is reversed.

CONCLUSION

The rejection of claims 10, 2, and 3 under 35 U.S.C. § 103(a) over Nishikawa is sustained.

The rejection of claims 10, 2, and 3 under § 103(a) over Reggia is reversed.

The rejection of claims 10 and 2-4 under § 103(a) over Goubau is sustained.

The rejections of claims 4-7 and 9 under § 103(a) over Nishikawa or Reggia or Goubau in view of Shibano are reversed.

The rejection of claim 8 under § 103(a) over Nishikawa and Parham is sustained over Nishikawa alone and the rejections of claim 8 under § 103(a) over Reggia or Goubau in view of Parham are reversed.

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No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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LEE E. BARRETT)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS
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